

REVIEW OF APPLICATION FOR CERTIFICATION OF STEVENS MILL HYDROELECTRIC PROJECT

This report provides review findings and recommendations related to the application submitted to the Low Impact Hydropower Institute (LIHI) by Eagle Creek Renewable Energy LLC (Applicant) for Low Impact Hydropower Certification of the Stevens Mill Hydroelectric Project (the Project) on the Winnepesaukee River in the town of Franklin, New Hampshire.

I. PROJECT'S GEOGRAPHIC LOCATION

The Stevens Mill Hydroelectric Project is located in Franklin, N.H. Franklin is in the Lakes Region of central New Hampshire. The Winnepesaukee River drains New Hampshire's largest lake, Lake Winnepesaukee, and flows southwest 10.5 miles to join with the Pemigewasset River, forming the Merrimack River. The Project is 1.5 miles upstream of the confluence of the Winnepesaukee and the Pemigewasset rivers. The dam is the second one upstream of the confluence; the Franklin Falls Dam (LIHI Certificate #83) is located about one mile downstream of the Project. The Merrimack River flows south to Massachusetts where it turns northeastward to empty into the Atlantic Ocean at Newburyport.

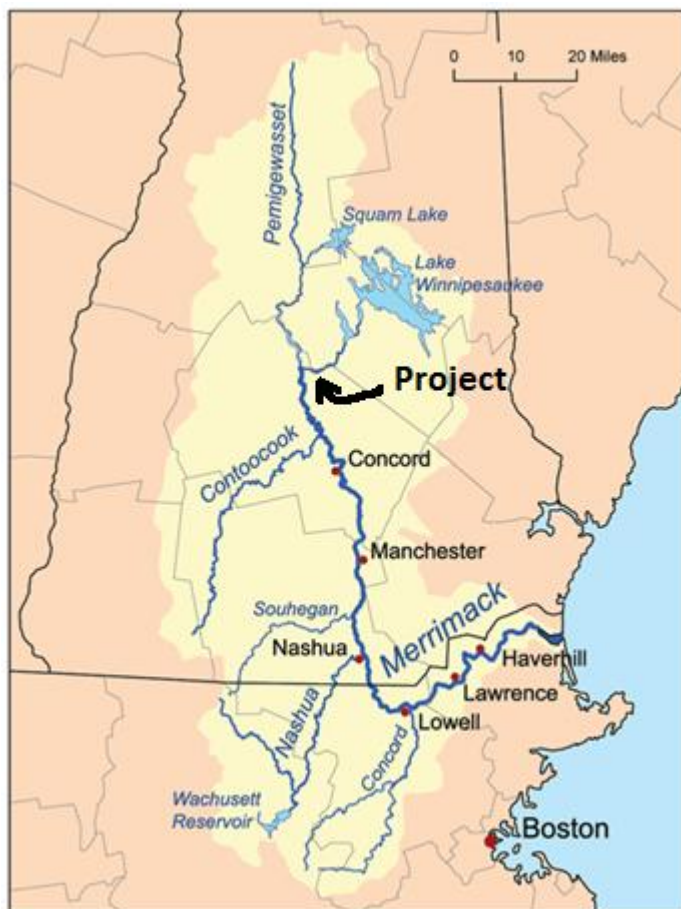


Figure 1. Merrimack River basin showing project location. (source: Karl Musser)

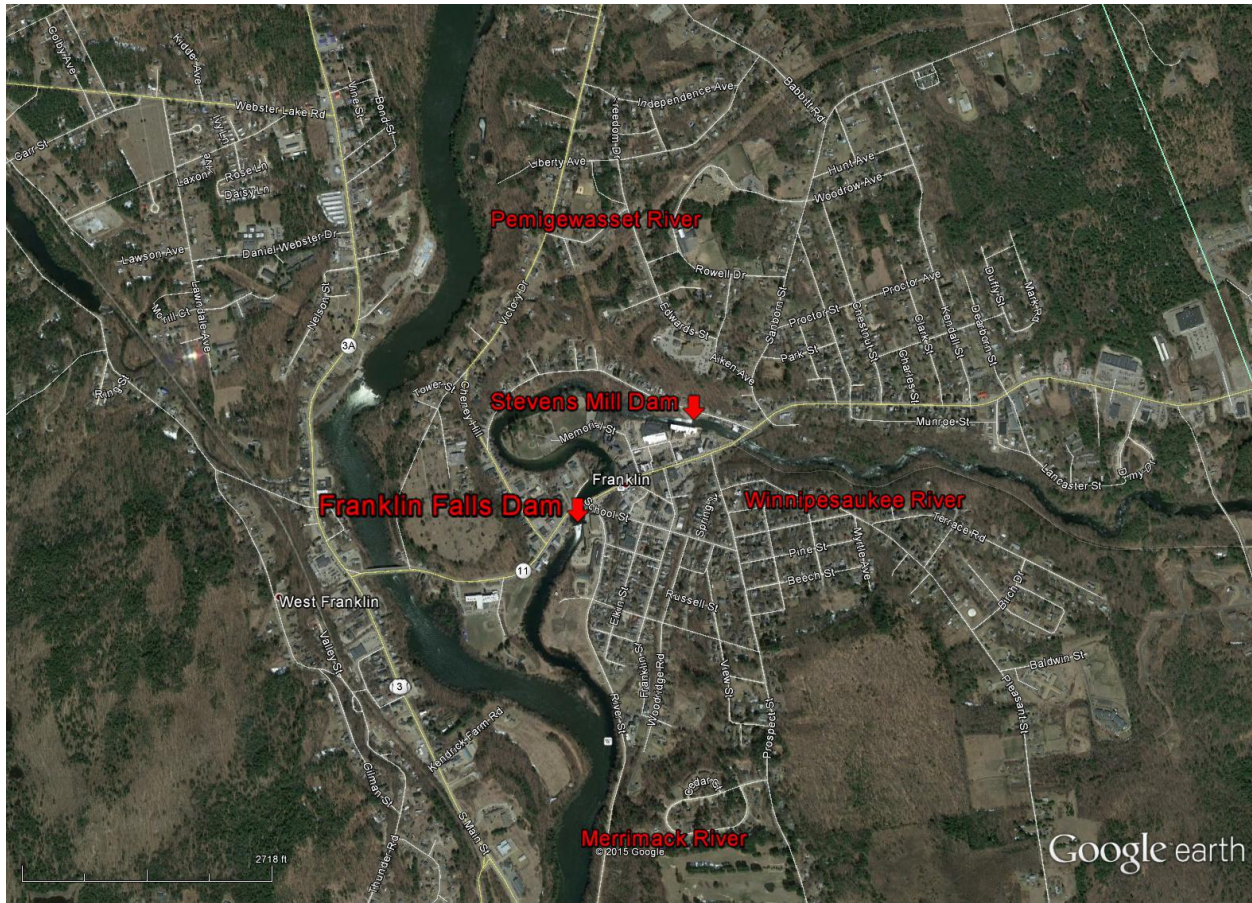


Figure 2. Location of the Stevens Mill Hydroelectric Project.

II. PROJECT AND IMMEDIATE SITE CHARACTERISTICS



Figure 3. Stevens Mill Dam and Building No. 1.

The site was originally developed in the early 1900s by the M.T. Stevens Company, a manufacturer of woolen dress goods. The origins of the company can be traced to J.P. Stevens and Company, which was founded in 1813 in North Andover, Massachusetts by Captain Nathaniel Stevens and produced woolen broadcloth in 1813. In 1901, Moses T. Stevens incorporated the company, constructed the Stevens Mill Complex and associated hydroelectric facilities, and changed the company name to M.T. Stevens Company.

The Project utilizes two generating units located in separate powerhouses. Unit 1 (236 kW) is located on the north side of the river immediately across from the Stevens Mill Building No. 1 while Unit 2 (1,700 kW) is located approximately 900 feet southwest of the dam and adjacent to Stevens Mill Building No. 2. The two units comprise the Stevens Mill facility (Bow Street powerhouse) and the River Bend facility, respectively. Unit 1 is connected to the dam via a 150-foot penstock, and Unit 2 via a 740-foot penstock. Unit 1 is a Flygt turbine that was installed in 1985; it is used to maintain conservation flows in the reach of river bypassed by the River Bend station.

The Project dam is a concrete gravity structure approximately 80 feet long and 22 feet high. The crest elevation is reported as 312.55 feet NGVD; however, it is equipped with a 3-foot-high Obermeyer inflatable crest gate, which was installed in 2008 and provides an overflow elevation of 315.28 feet. With the pool maintained at approximately elevation 315 feet, the impoundment

covers approximately one acre with an average depth of about seven feet. The Franklin Falls dam controls the tailwater elevation, about 281.5 feet NGVD, at the River Bend facility.

The Project has an average annual production of 4,721,000 kWh (Stevens Mill: 1,182,000 kWh and River Bend: 3,539,000 kWh).



Figure 4. Project layout.



Figure 5. River Bend powerhouse.

III. REGULATORY AND COMPLIANCE STATUS

On June 14, 1983, the Federal Energy Regulatory Commission (FERC) issued an exemption from licensing of a small hydroelectric project 5 megawatts or less (Project No. 3760) to the Franklin Electric Light and Power Company. The exemption was subsequently amended on August 20, 1998 to reflect the removal of the c. 1907 250 kW generating unit located in the Bow Street powerhouse; the unit had been idle since 1992 due to mechanical difficulties. The generating capacity of the project was reduced from the authorized 2,161 kW to 1,936 kW. Franklin Industrial Complex, Inc. purchased the Stevens Mill buildings and hydroelectric generating equipment in August 1982. Algonquin Power Systems, Inc (Algonquin) purchased the hydroelectric generating assets from Franklin Industrial Complex Inc. in the mid-1980s, including all of the rights and privileges associated with the FERC exemption. The Stevens Mill generating assets were subsequently sold to Eagle Creek Renewable Energy LLC in July 2013.

No compliance issues were revealed in my review of the last ten years of documents in eLibrary. The Applicant files annual self-certification reports of minimum-flow compliance, and provided LIHI with copies for the calendar years 2008-12. FERC e-Library contains a copy of the 2013 report as well. None of the reports indicated any violations of the minimum-flow requirements.

IV. PUBLIC COMMENTS RECEIVED BY LIHI

The LIHI application was deemed complete and publicly noticed on March 11, 2015. No comments were received during the notice period, which ended May 11, 2015.

V. LIHI CRITERIA REVIEW

Under each of the issue sections that follow, I include a table that contains the related LIHI questionnaire sections and my analysis and conclusions.

General Conclusions and Recommendations. On August 14, 2014, the Applicant entered into a 5-year renewable agreement (MOA) with the U.S. Fish and Wildlife Service (USFWS) to address bypass conservation flows, flow compliance monitoring, and fish passage at its New Hampshire projects with the intent that the projects would qualify for LIHI certification. The agreement was endorsed by the New Hampshire Department of Fish and Game (NHDFG) by letter dated August 27, 2014. The MOA and support letter are appended to this report.

I recommend that the facility be conditionally certified for the standard period of five years, with five recommended conditions to address issues related to bypass flows, flow monitoring, fish passage, water quality, and the term of the MOA. If these conditions are attached to the certification, in my opinion the Project will meet all of LIHI's criteria for the reasons summarized below.

Regarding flows, the facility maintains true run-of-river operation and releases a minimum bypass flow at either the dam or the Bow Street station; however, no record keeping system is in place to demonstrate compliance. Further, the 100 cfs minimum bypass flow may not be appropriately protective of fish and other aquatic biota resources. Both of these issues are recognized in the MOA and are to be resolved.

Regarding water quality, the New Hampshire Department of Environmental Services (NHDES) had requested certain information from the Applicant to enable it to reach a conclusion on compliance with state water quality standards for the purpose of the LIHI application. Water quality sampling completed in 2013 unfortunately produced unreliable data, and a second data collection effort is planned for 2015. The data should enable NHDES to confirm that the Project is compliant with quantitative water quality standards.

Regarding fish passage, the Facility currently lacks downstream passage facilities for the anadromous river herring, which are stocked upstream, and for the catadromous American eel, which has an indigenous population that persists in the watershed. The MOA addresses downstream fish passage for eel and river herring, and provides for review of upstream passage in 2020. I recommend that the certification be conditioned to require fish passage consistent with the terms of the MOA and notification of LIHI should any resource agency pursue upstream fish passage during the LIHI certification term.

Regarding other LIHI criteria, there are no known listed T&E species at the site. Recreational access is available with no fees charged. No outstanding cultural resource issues are apparent in the record. The watershed protection criteria do not apply, and there is no watershed enhancement fund that would qualify the facility for extension of the certification term by three years. No dam removal has been recommended.

Issue 1. The current minimum flow released into the bypass may not be appropriately protective of fish and other aquatic biota.

Recommended Condition No. 1. Eagle Creek Renewable Energy LLC shall comply with Section 4.1 of the August 14, 2014 Memorandum of Agreement by implementing appropriately protective bypass conservation flows immediately upon approval by the U.S. Fish and Wildlife Service and the New Hampshire Department of Fish and Game. Since this certification is being granted without the minimum bypass flow having been deemed appropriately protective by the resource agencies, LIHI may withdraw certification if it determines that Eagle Creek Renewable Energy LLC is failing to make a good faith effort to cooperate with the resource agencies in determining a final minimum bypass flow. Eagle Creek Renewable Energy LLC shall provide LIHI with monthly status updates until this issue is resolved.

Issue 2. The Facility does not maintain records for monitoring compliance with the flow management requirements of the exemption.

Recommended Condition No. 2. Eagle Creek Renewable Energy LLC shall develop a system for producing and maintaining records sufficient to demonstrate compliance with the headpond elevation and flow management limitations for an instantaneous run-of-river operation and bypass conservation flows, including flows as necessary to operate fish passage measures. Eagle Creek Renewable Energy LLC shall comply with Section 4.2 of the August 14, 2014 Memorandum of Agreement. Within three months of the date of issuance of the certification, Eagle Creek Renewable Energy LLC shall provide LIHI with a copy of the operations and flow monitoring plan. Prior to filing the plan, Eagle Creek Renewable Energy LLC shall obtain plan approval from U.S. Fish and Wildlife Service and New Hampshire Department of Environmental Services; written confirmation of the approvals will be filed with the plan. The plan shall be updated as necessary to reflect any future changes in minimum bypass flows and flow releases for fish passage operation.

Issue 3. The Facility does not provide passage measures for eel, river herring, and other migratory fish. Downstream passage for eel and river herring is a current need.

Recommended Condition No. 3. To address fish passage, Eagle Creek Renewable Energy LLC shall comply with Section 4.3 of the August 14, 2014 Memorandum of Agreement. Eagle Creek Renewable Energy LLC shall notify LIHI within 14 days of completion of permanent downstream passage facilities for eel and river herring. During the term of this certification, should a resource agency request implementation of upstream passage at the Facility, Eagle Creek Renewable Energy LLC shall so notify LIHI within 14 days and provide LIHI with a copy of the request and its response.

Issue 4. Without water quality sampling data, NHDES is unable to make a determination that the Facility is compliant with the state's quantitative water quality standards.

Recommended Condition No. 4. To enable NHDES to make a determination of Project compliance with New Hampshire quantitative water quality standards, Eagle Creek Renewable Energy LLC shall complete water quality sampling during summer 2015 following a study plan approved by NHDES. By December 31, 2015, Eagle Creek Renewable Energy LLC shall provide LIHI with a review and conclusions letter from NHDES. If NHDES determines that structural or operational changes are necessary to meet water quality standards, Eagle Creek Renewable Energy LLC will provide LIHI with a proposed implementation schedule at the same

time it files the NHDES letter.

Issue 5. The MOA has a five-year term (MOA Section 1.1). Unless renewed through mutual agreement, it will expire on August 14, 2019¹, which may be before the end of the LIHI certification term. Given that, the Applicant should be required to notify LIHI as to whether the MOA term will be extended.

Recommended Condition No. 5. On or before July 1, 2019, Eagle Creek Renewable Energy LLC shall notify LIHI as to the status of the August 14, 2014 Memorandum of Agreement with respect to its renewal.

A. *Flows*

Flows in the Winnepesaukee River are highly managed through the control of lake levels at Lake Winnepesaukee. NHDES has entered into water user contracts with the owners of ten downstream hydroelectric facilities, including those on the Winnepesaukee River. For the Winnepesaukee River, in succession starting at the uppermost site, the facilities are Lakeport (outlet of Lake Winnepesaukee), Avery (outlet of Opechee Lake), Lochmere (outlet of Lake Winnisquam), Clement, Stevens Mill, and Franklin Falls. The Applicant owns Lakeport (FERC No. 6440), Lochmere (FERC No. 3128), Clement (FERC No. 2966, acquired June 2014) and the subject project. According to the NHDES website (http://www2.des.state.nh.us/rti_home/winni.asp), downstream dam owners have a permanent deeded right to a release of 250 cfs from the lake, that right dating back to the 19th century.

¹ Technically, the MOA is written such that the renewal would not occur until after the end of the 5-year term.

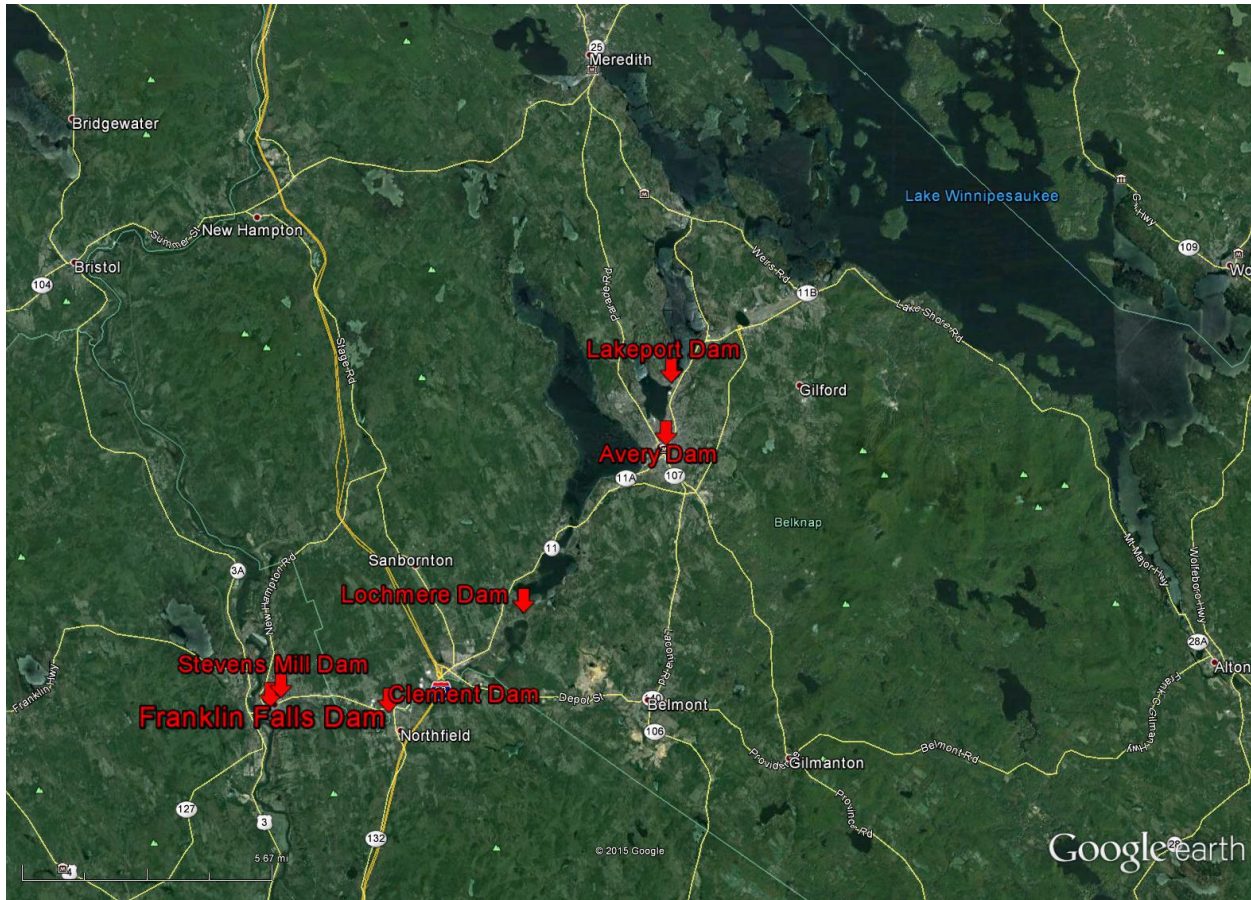


Figure 6. Winnepesaukee River watershed dams.

The project is operated as a run-of-river facility. Outflows from the project equal inflows on an instantaneous basis, and water levels above the dam are maintained at the crest of the dam and are not drawn down for the purposes of generating power. The exemptee is required to maintain a minimum flow of 100 cfs or inflow to the project, whichever is less, at all times either through Unit 1 (Bow Street powerhouse at the dam) or through the 6.5 foot wide by 9 foot high sluice gate located at the left abutment. This conservation flow was likely prescribed by the USFWS as part of the exemption process, although the Applicant could not produce underlying documentation (the “terms and conditions” letters from the resource agencies under Standard Article 2 of an exemption). The application also indicates that the exemption requires run-of-river operation. The total drainage area of the river at the Project dam is approximately 485 square miles. The bypass minimum flow is substantially less than flows set using either the USFWS Aquatic Base Flow standards or the Montana-Tennant method for good habitat conditions.

The hydraulic capacity of the Bow Street station is 100-200 cfs, and that of the River Bend station is 200-800 cfs (email from Steve Hickey, Essex Power Services, to LIHI, March 11, 2015). The Project has a headpond level sensor and is automated to maintain its run-of-river operation (fixed headpond elevation at the flashboard system crest) and bypass conservation flows. The reach of river bypassed by the River Bend station is about 4,100 feet long.

Under the MOA (Section 4.1), the Applicant will determine appropriate bypass conservation flows in consultation with, and subject to approval by, the USFWS. The flows would be instituted upon certification of the facility by LIHI. The Applicant will also draft a flow management/monitoring plan for submittal to, and approval by, the USFWS (MOA, Section 4.2). The draft plan was to have been filed with the USFWS by February 14, 2015. To date, I have been unable to confirm that the filing was made. To set conservation flows for the bypassed reach, a flow demonstration study is to be completed this summer.

Since the Facility currently does not maintain bypass conservation flows that conform with the LIHI flow criteria, I recommend that LIHI certification be subject to Recommended Condition #1.

Since the Applicant currently does not maintain records that can be used to demonstrate compliance with the LIHI flow criteria, I recommend that LIHI certification be subject to Recommended Condition #2.

LIHI Questionnaire: Flows	
A.1	Is the Facility in <i>Compliance with Resource Agency Recommendations</i> issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?
	Reviewer Analysis/Conclusions: This subcriterion only applies when Resource Agency Recommendations were made in or after 1987. Since the current bypass conservation flow and run-of-river operating requirement stem from the 1983 FERC exemption, this subcriterion does not apply. N/A = Go to A.2
A.2	If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or “good” habitat flow standards calculated using the Montana-Tennant method?
	Reviewer Analysis/Conclusions: With respect to the below-tailrace reach, the Facility meets the Flow criterion under A.2, as the Facility is operated strictly run-of-river manner; however, the 100 cfs bypass flow is substantially less than the USFWS summer Aquatic Base Flow (ABF), which would be on the order of 243 cfs at this location the river. To assure compliance, Recommended Condition #2, which requires on-site record keeping, should be adopted. YES with respect to the below-tailrace reach (so long as Recommended Condition #2 is attached to the certification) NO with respect to the bypassed reach = Go to A.3
A.3	If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that demonstration, that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?

	Reviewer Analysis/Conclusions: With respect to the bypassed reach, a flow study is to be completed to establish appropriate conservation flows per the MOA, Section 4.1. YES with respect to the bypassed reach (so long as Recommended Condition #1 and Recommended Condition #2 are attached to the certification) = PASS
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B. Water Quality

Because this project was granted an exemption by FERC, there is no state water quality certification. By letter dated October 17, 2013, NHDES requested certain information to enable it to make a determination as to whether the facility is compliant with state water quality standards. NHDES specifically sought 1) quantitative data on dissolved oxygen, temperature, chlorophyll-a, and total phosphorus; 2) information artificial pond level fluctuations; 3) information on minimum flows; and 4) information on fish passage. The Applicant completed a water quality sampling program in 2013 for the purpose of demonstrating compliance with the quantitative N.H. water quality standards; however, NHDES determined that the data was faulty (attributed to mechanical malfunction of data loggers located in the headpond and at the tailrace). Consequently, sampling is again planned for the 2015 season.

Presently, based on NHDES's knowledge of such factors as available water quality data, river characteristics, permitted wasteloads, project operating constraints (e.g., spillage, hydraulic operating range), and other relevant data, NHDES is not in a position to state that it is reasonably assured that the facility complies with water quality standards. In this case, NHDES is deferring on making a determination of compliance until the 2015 sampling data becomes available (email from NHDES, June 5, 2015, appended). I am, however, confident that NHDES will find that the facility is compliant with the quantitative water quality criteria: 1) the headpond at Stevens Mill is extremely small, limiting residence time for water passing through; 2) the free-flowing river reach upstream to the next dam is long, and water entering the headpond should be well aerated; and 3) sampling was done for the Franklin Falls facility downstream in 2011, and the river met standards at that location. Consequently, I am recommending certification conditional on completion of the 2015 sampling and submittal to NHDES to confirm compliance with state standards.

The Winnepesaukee River in the Project vicinity is not listed as a Category 5 water (impaired in need of a TMDL) in the 2012 303(d) list. At the time of assessment, there was a lack of data upon which to make a determination of use support.

LIHI Questionnaire: Water Quality	
B.1	<p>Is the Facility either: a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?</p> <p>Reviewer Analysis/Conclusions: The Project does not have a water quality certification. The Applicant will be collecting quantitative water quality data in 2015 for submittal to NHDES. I recommend conditional certification of the Project as discussed above. Due to the lack of data, NHDES does not at this time have reasonable assurance that standards are being met. YES to (b) (so long as Recommended Condition #4 is attached to the certification) = Go to B.2</p>
B.2	<p>Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?</p> <p>Reviewer Analysis/Conclusions: The Winnepesaukee River is not 303(d) listed either immediately upstream (Assessment Unit NHIMP700020203-07) or immediately downstream (Assessment Unit NHRIV700020203-18) of the Facility dam. NO = PASS</p>

C. Fish Passage and Protection

According to *Strategic Plan & Status Review, Anadromous Fish Restoration Plan, Merrimack River* (Technical Committee for Anadromous Fishery Management of the Merrimack River Basin and Advisors to the Technical Committee, October 16, 1997), anadromous fish were well distributed in the upper Merrimack River basin historically. The Pemigewasset River basin served as the principal source of salmon production, while shad and river herring (alewives and blueback herring) more likely utilized the Winnepesaukee, the Merrimack River mainstem and other Merrimack tributaries. In 1847, the Essex Dam in Lawrence, Massachusetts was constructed at River Mile 30, blocking anadromous fish runs to critical upstream habitat. Atlantic salmon became extirpated, while shad and river herring maintained diminished populations by using available habitat downstream of Essex Dam.

As part of the exemption proceeding, the USFWS is likely to have reserved authority to prescribe fish passage; however, the terms and conditions letter was unavailable from the Applicant. No prescriptions have been issued to date. Restoration plans for salmon and shad in the Merrimack River basin do not include the Winnepesaukee River.

The strategic plan indicates that NHDFG released river herring into Lake Winnisquam to establish as a forage base. (Lake Winnisquam is about eight miles upstream of the Project dam.) From this stocking (1984-90), a significant number of juveniles were found to descend from the lake to the Merrimack River and continue their outmigration to the ocean. In at least in one year (2010) herring were stocked in Silver Lake (a lake directly downstream from Lake Winnisquam).

Current restoration plans focus is on tributaries lower in the drainage.

The USFWS is engaged in an ongoing effort to protect and enhance the depleted coastwise stock of American eel, a catadromous fish species. A large population of eels inhabited Lake Winnepesaukee in the past and was subject to substantial turbine mortality at hydroelectric dams during outmigration in the late summer/fall. USFWS biologists surveying the Winnepesaukee River at the Lakeport hydroelectric facility had found the remains of dead adult silver eels and that, upon further inquiry, it had been determined that turbine mortality to eels is an annual, ongoing problem of which it had been unaware. Measures to accommodate outmigration and reduce mortality and injury can include intake screening (3/4-inch or less) and a fish sluice or seasonal nighttime project shutdowns during the passage season. The MOA (Section 4.3) defines the passage period as August 15 through November 15. Pending completion of the permanent passage measures, nighttime shutdowns will be used to accommodate passage; shutdowns will be triggered by a rain event or NHDES high-flow releases from Lake Winnepesaukee.

The conceptual proposal at Stevens Mill to address downstream passage for outmigrating herring and eel is to screen the Bow Street intake and to provide safe passage at the River Bend forebay. The upper portion of the trashrack, which is perpendicular to river flow, would be closed off, and the adjacent sluice gate would be restored and modified to provide a surface discharge for fish conveyance. When active, the sluice would pass a portion or all of the bypass conservation flow. These measures are to be installed during the 2015 construction season.

Downstream passage for herring and eels should be accommodated to protect these fish, including trashrack modification and a means to pass through the dam site unharmed. Upstream passage can be deferred for now. It is unlikely that upstream passage facilities will be needed within the 5-year term of the LIHI certification, but the issue should be revisited if there is an application for recertification. Condition #3 is recommended in order to have downstream passage in place by the 2015 outmigration season and to provide for LIHI notification should a resource agency request upstream passage during the term of the certification.

Under the MOA, upstream passage will be reviewed in 2020.

LIHI Questionnaire: Fish Passage and Protection	
C.1	Are anadromous and/or catadromous fish present in the Facility area or are they known to have been present historically?
	Yes with respect to both = Go to C.2
C.2	Is the Facility in Compliance with <i>Mandatory Fish Passage Prescriptions</i> for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?
	<i>Reviewer Analysis/Conclusions:</i> No prescription exists. N/A = Go to C.3
C.3	Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?

	<p>Reviewer Analysis/Conclusions: As discussed above, shad and river herring are believed to have used the Winnepesaukee River basin until blocked by construction of downstream dams in the 1800s. Current presence of river herring is due to upstream stocking and not natural runs. American eels were present historically and persist.</p> <p>Yes with respect to anadromous fish = Go to C.3.a</p> <p>No with respect to catadromous fish = Go to C.4</p>
C.3.a	<p>If the fish are extinct or extirpated from the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?</p> <p>Reviewer Analysis/Conclusions: Anadromous fish access to the upper basin ended with the construction of Essex Dam in Massachusetts.</p> <p>Yes with respect to anadromous fish = Go to C.3.b</p>
C.3.b	<p>If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?</p> <p>Reviewer Analysis/Conclusions: Such a request has not been made to date.</p> <p>N/A with respect to anadromous fish = Go to C.4</p>
C.4	<p>If, since December 31, 1986:</p> <ul style="list-style-type: none"> a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C3a above), and b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription, c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility? <p>Reviewer Analysis/Conclusions: The agencies have had an opportunity to prescribe fish passage as a reserved right under the exemption terms and conditions but have not done so to date. As discussed above, downstream passage for herring was considered but there was no follow through. None of the three factors apply to this Facility.</p> <p>N/A for both anadromous and catadromous fish = Go to C.5</p>
C.5	<p>If C4 was not applicable:</p> <ul style="list-style-type: none"> a) are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? OR b) If the Facility is unable to meet the fish passage standards in 4.a, has the Applicant either i) demonstrated, and obtained a letter from the U.S. Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and

	<p>downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource, or ii) committed to the provision of fish passage measures in the future and obtained a letter from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service indicating that passage measures are not currently warranted?</p> <p>Reviewer Analysis/Conclusions: To qualify the Project for LIHI certification, the Applicant has entered into a MOA with the USFWS to address current downstream passage needs at the Project and to review the need for upstream passage in 2020. YES to (b) for both anadromous fish and catadromous fish (so long as Recommended Condition #3 is attached to the certification) = Go to C.6</p>
C.6	<p>Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of Riverine fish?</p> <p>Reviewer Analysis/Conclusions: There are no prescriptions for riverine fish. N/A = Go to C.7</p>
C.7	<p>Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?</p> <p>Reviewer Analysis/Conclusions: There are no Resource Agency Recommendations for entrainment protection measures. MOA downstream passage measures will provide protection of eels and river herring from entrainment and impingement. N/A = PASS</p>

D. Watershed Protection

The Facility dam creates an impoundment with a surface area of about one acre. The dam's backwater extends less than 500 feet upstream. The Facility is located in downtown Franklin, a developed urban area. No protected buffer zones have been created along the riverine impoundment through a settlement agreement or the federal exemption.

LIHI Questionnaire: Watershed Protection	
D.1	<p>Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline?</p> <p>Reviewer Analysis/Conclusions: There are no buffer zones at this project. NO = Go to D.2</p>
D.2	<p>Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?</p> <p>Reviewer Analysis/Conclusions: There is no watershed enhancement fund. The facility does not qualify for an extension of the LIHI certification term by three years. NO = Go to D.3</p>
D.3	<p>Has the facility owner/operator established through a settlement agreement with appropriate stakeholders and that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for</p>

	conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation).
	Reviewer Analysis/Conclusions: There is no settlement agreement. NO = Go to D.4
D.4	Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project?
	Reviewer Analysis/Conclusions: The Applicant has neither records of agency recommendations nor a shoreline management plan. N/A = PASS

E. Threatened and Endangered Species Protection

There is no record that T&E species use the Project area. The Project is in an urban setting. The MOA indicates that the Project will not adversely affect federally designated threatened and endangered species or their critical habitat. The USFWS is currently reviewing a 2010 petition by the Council for Endangered Species Act Reliability to determine whether American eel should be listed. A prior review, completed in 2007, determined that listing was not warranted at that time. (<http://www.fws.gov/northeast/newsroom/eels.html>) By letter dated July 30, 2013, the New Hampshire Natural Heritage Bureau confirmed that no state-listed species are known to occur in the Project area.

LIHI Questionnaire: Threatened and Endangered Species Protection	
E.1	Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?
	Reviewer Analysis/Conclusions: There is no record of state or federally listed T&E species at the Project presently. NO = PASS

F. Cultural Resource Protection

There is no evidence of conflicts with respect to cultural resources protection. During the FERC exemption process, the Stevens Mill complex was identified as being within the Franklin Falls Historic District listed in the National Register of Historic Places. By letter dated April 19, 1983, the applicant for the exemption agreed to implement cultural resource mitigation measures as outlined in a February 14, 1983 letter issued by the New Hampshire Department of Resources and Economic Development in response to the application for exemption. A determination was made that, based on the implementation of the cultural resource mitigation measures described in their February 14, 1983 letter, the Stevens Mill project would have no adverse effect upon properties within the Franklin Falls Historic District. According to the LIHI certification application, the Stevens Mill project has continuously operated under the parameters established in the February 14, 1983 letter and has had no adverse impact on historical or cultural resources.

located within the project boundary. The FERC exemption incorporates Special Article 6 to address historic properties by requiring consultation with the State Historic Preservation Officer and implementing certain measures to avoid or mitigate impacts to the district.

Article 6. The Exemptee shall, in consultation with the New Hampshire State Historic Preservation Officer (SHPO), and prior to any construction that will impact any structural components of the Franklin Falls Historic District, implement the following measures to avoid or mitigate impacts to the district from the project: (1) project construction shall not include the demolition of any historic building within the district; (2) the new penstock in the Stevens Mill powerhouse will be constructed so as to exit the west wall of the building in a manner similar to that of the existing penstock on the east side; (3) the Secretary of the Interior's Standards for Historic Preservation Projects shall be adhered to in all exterior rehabilitation and restoration work at the River Bend, Stevens Mill, and Bow Street hydroelectric stations, in repairs and any necessary rehabilitation or restoration of Stevens Mill Dam and existing penstock, and in the construction of new penstock; (4) the existing penstock and the internal equipment of the River Bend, Stevens Mill, and Bow Street hydroelectric stations will be assessed to determine their historical significance, and will be documented in a report according to the standards of the Historic American Engineering Record of the U.S. Department of the Interior if it is determined that such equipment or penstock is significant and will be impacted by the project; (5) the number and location of dry hydrants or other fire protection measures that will be necessary in the project vicinity for the historic district will be approved by the Fire Chief of the City of Franklin; (6) Riprap will be placed on the side of the island nearest the River Bend Mill to prevent excessive erosion from the tailwater of the River Bend station. The Exemptee shall make funds available in a reasonable amount for the implementation of these measures as required. If any previously unrecorded archeological or historical sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Exemptee shall consult with the SHPO to develop and implement a mitigation plan for the protection of significant archeological or historical resources.

Figure 7. Special Article 6 of the FERC exemption.

LIHI Questionnaire: Cultural Resource Protection	
F.1	If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?
	Reviewer Analysis/Conclusions: No conflicts were identified in the record.
	YES = PASS

G. Recreation

The application states that little or no recreation occurs at the project due to the “location between buildings on both banks, the rocky nature of the reach of the Winnepesauke River upon which the project is located and the commercially developed aspect of the project property...” A boat take-out is located about 200 feet upstream of the dam. Access to the reservoir and downstream reach is permitted without charge. The project boundary is shown in Figure 4.

LIHI Questionnaire: Recreation	
G.1	If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption? <i>Reviewer Analysis/Conclusions:</i> The categorical exemption does not require any specific provisions for recreation. No formal requirements or Recommendations apparently exist. YES = Go to G.3
G.3	Does the Facility allow access to the reservoir and downstream reaches without fees or charges? <i>Reviewer Analysis/Conclusions:</i> Access is provided without charge. YES = PASS

H. Facilities Recommended for Removal

The record does not indicate an interest on the part of resource agencies in removing the dam.

LIHI Questionnaire: Facilities Recommended for Removal	
H.1	Is there a Resource Agency Recommendation for removal of the dam associated with the Facility? <i>Reviewer Analysis/Conclusions:</i> No. NO = PASS

APPENDIX

Contents

Contacts..... A-1
Correspondence A-2 to A-17

CONTACTS

Entity	Authorized Representatives	Contact Information
Eagle Creek Renewable Energy LLC (applicant)	Dave Youlen, Executive Vice President Stephen Hickey	65 Madison Avenue, Suite 500 Morristown, NJ 07960 Telephone: (973) 998-8400 Email: dave.youlen@eaglecreekre.com Essex Power Services, Inc. 55 Union Street, 4th Floor Boston, MA 02108 Telephone: (617) 367-0032 Email: sjh@essexhydro.com
United States Fish and Wildlife Service	John P. Warner Assistant Supervisor	Conservation Planning Assistance and Endangered Species New England Field Office, U.S. Fish and Wildlife Service 70 Commercial Street, Suite 300 Concord, NH 03301 (603) 223-2541 - ext.15 Email: John.Warner@fws.gov
NH Department of Environmental Services	Ted Walsh Surface Water Monitoring Coordinator	NHDES, Watershed Management Bureau 29 Hazen Drive, P.O. Box 95 Concord, New Hampshire 03301-0095 Telephone: (603) 271-2083 Email: Ted.Walsh@des.nh.gov
New Hampshire Water Resources Board	Delbert F. Downing Chairman	37 Pleasant Street Concord, NH 03301
New Hampshire Department of Fish and Game	Carol Henderson Fish & Wildlife Ecologist Kim Tuttle Certified Wildlife Biologist	New Hampshire Fish and Game Department 11 Hazen Drive Concord, NH 03301 Telephone: (603) 271-3511 Email: Carol.Henderson@wildlife.nh.gov Telephone: (603) 271-6544 Email: Kim.Tuttle@wildlife.nh.gov
State Historical Preservation Office	Not provided	
National Park Service Rivers and Special Studies Branch	Kevin Mendik	Telephone: (617) 223-5299 Email: kevin_mendik@nps.gov

FISH PASSAGE and PROJECT OPERATIONS

MEMORANDUM OF AGREEMENT

Eagle Creek RE Management and the U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This Memorandum of Agreement (Agreement) is entered between the United States Fish and Wildlife Service (Service) and Eagle Creek RE Management, LLC (ECREM). ECREM is a Delaware limited liability company and is wholly owned by Eagle Creek Renewable Energy, LLC (ECRE). Individually, the above may be referred to as a "Party," collectively "Parties."

1.1 Term of the Agreement

This Agreement will remain in full force and effect for a period of five years from the date of the Agreement. After that time the parties can, by mutual agreement, extend the term of the contract for one or more subsequent five-year periods. Either party may also terminate this Agreement at the end of each five-year term without liability to any other party or any further obligations hereunder.

1.2 Purpose

This Agreement establishes a plan and schedule for addressing fish passage and minimum flow issues at ECREM's hydroelectric projects in New Hampshire that will facilitate receiving certification as a low-impact hydroelectric project by the Low Impact Hydroelectric Institute (LIHI). Upon the execution of the Agreement, the Service will provide a supporting letter for the ECRE application to LIHI within three weeks of signing.

1.3 Agency Appropriations

Nothing in this Agreement shall be construed as obligating the Service to expend in any fiscal year any sum in excess of appropriations made by Congress to state or local legislatures or administratively allocated for the purpose of this Agreement for the fiscal year or to involve the Service in any contract or obligation for the future expenditure of money in excess of such appropriations or allocations.

1.4 Establishes No Precedents

The Parties have entered into the negotiations and discussions leading to this Agreement with the explicit understanding that all discussions relating thereto are privileged, shall not prejudice the position of any Party or entity that took part in such discussions, and are not to be otherwise used in any manner in connection with these or any other proceedings. The Parties understand and agree that this Agreement establishes no principles or precedents with regard to any issue which is not addressed herein or with regard to any Party's participation in future

relicensing proceedings unrelated to the agreements set forth herein and that none of the Parties to this Agreement will cite this as establishing any principles or precedents except with respect to the matters to which the Parties have herein agreed.

1.5 Binding Effect

This Agreement shall be binding on the Parties and on their successors and assigns.

1.6 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

2.0 BACKGROUND

Various wholly owned subsidiary companies of ECRE have acquired the ownership interests in several of the hydroelectric generation projects located in the State of New Hampshire which were previously owned or leased by Algonquin Power Systems. These projects are Mine Falls Project (FERC No. 3442) on the Nashua River; Gregg Falls Project (FERC No. 3180) on the Piscataquog River; Webster-Pembroke Project (FERC No. 3185) on the Suncook River; and the Lakeport Project (FERC No. 6440), Lochmere Project (FERC No. 3128) and Stevens Mills Project (FERC No. 3760) (which includes both Stevens Mills and Riverbend facilities projects on the Winnepesaukee River (each a "Project" or "Facility" and collectively "Projects" or "Facilities")). These purchases were consummated on June 29, 2013. ECRE is also in the process of evaluating the acquisition of the Clement Project (FERC No. 2966), also located on the Winnepesaukee River.

The Projects acquired by ECRE have either a License or an Exemption from Licensing issued by the Federal Energy Regulatory Commission (FERC). Those licenses and exemptions include various requirements for Project operations, including bypass flow releases, and for providing fish passage when needed. The Service has identified fish passage needs at many of the subject projects. In addition, in order to address low impact hydropower certification criteria established by LIHI, ECRE needs to consult with the Service on project operations and flow releases in addition to fish passage.

ECREM is the entity within the Eagle Creek group of companies that manages the operations on behalf of and as agent for various project companies owned by ECRE. Since the acquisition of these assets, ECREM has worked in cooperation with the Service and other agencies to improve fish passage and prevent fish kills at several of its hydro projects in New Hampshire and elsewhere.

ECREM leadership has had a long history of cooperation with the Service and other agencies regarding fish passage and is keenly aware of the benefits provided to the public from such enhancements. ECREM seeks to maintain a cooperative relationship with the Service, and therefore is entering into this Agreement in support of the program goals established by the Service and other resource agencies.

3.0 GENERAL AGREEMENTS OF THE PARTIES

3.1 Reopeners

The Parties agree that, except as provided herein, this Agreement is not intended to limit or restrict the ability of any Party to petition FERC pursuant to any reopener condition contained in any license, including any exercise by the Secretary of the Department of the Interior relating to her/his fishway prescription authority under §18 of the Federal Power Act. No such petition, including the exercise of §18 authority, may be filed without the filer's providing at least 60 days written notice of its intention to do so to all the other Parties and, promptly following the giving of notice, consulting with the other Parties regarding the need for and the purpose of the petition. In the event such a petition is filed, the filing Party shall include with its filing documentation of its consultation with the other Parties, a summary of their recommendations and of its response to those recommendations. The filing Party shall also serve a copy of its petition to all other Parties.

The Parties agree that nothing in this Agreement is intended to limit or restrict the ability of any Party to seek an amendment to this Agreement during the effective period of the license or as long as an exempted project is operated. Any Party proposing such an amendment to this Agreement shall provide all Parties with at least 60 days written notice of the proposed amendment using updated addresses as needed. If the amendment would require modification of the license or any other permit, the Licensee shall file all applications to amend any license or permits necessary to effectuate the agreed-upon changes, and the other Parties will support such efforts. An amendment to this Agreement shall be effective only upon the written consent of all Parties to this Agreement.

3.2 Compliance with the Endangered Species Act

As of July 1, 2014, the Service has determined that, based on the information available as of that date, except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under the Service jurisdiction are known to exist in the Projects' impact areas. In addition, no habitat in the Projects' impact areas is currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Therefore, no further

Endangered Species Act coordination or consultation with the Service is required at this time. Should Project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered.

4.0 ENVIRONMENTAL ENHANCEMENT MEASURES

4.1 Bypass Flows

ECREM shall, for the protection and enhancement of fish and aquatic habitat, provide continuous minimum flows to the bypass reaches of each Project as established in consultation with and approved by the Service, in accordance with the schedule in Appendix A. Once the Service has approved these flow regimes and the LIHI has formally approved Eagle Creek's LIHI application for the subject Facilities, ECREM will implement the agreed upon continuous minimum bypass flows. The flow requirements may be modified in the future as appropriate to address the effective operation of upstream fish passage facilities.

4.2 Flow Monitoring

ECREM shall, within six (6) months from the effective date of the Agreement, prepare and file for approval by the Service, an Operations and Flow Monitoring Plan for monitoring run-of-river operation and bypassed reach flow releases from the Projects. The Plan also should incorporate a description of the refill protocol that will be followed and how run-of-river operation and bypass flow releases will be provided during periods when the head pond is drawn down for dam maintenance. The Plan shall include a description and design of the mechanisms and structures that will be used, including any periodic maintenance and/or calibration necessary to ensure the devices work properly. In addition, a plan for recording data on Project operations to verify proper operations and minimum flow releases, and for maintaining such data for inspection by the Service and other resource agencies, also shall be filed. The operations and flow monitoring plan shall be developed in consultation with, and require approval by the Service.

4.3 Fish Passage

ECREM agrees to implement the activities related to fish passage at the Projects as described in Appendix A of this Agreement. The implementation of these activities will be performed in accordance with the schedule set forth in Appendix A or as mutually agreed upon between ECREM and the Service.

The proposed enhancements will consist of structural changes to provide for upstream passage at the Mines Falls Project, and exclusion and safe and effective downstream passage of river herring and/or American eel or seasonal Project shutdowns of the Project turbines, combined

with a safe egress route, or potentially a combination of both measures at all Projects. For some of the Projects, the fish passage measures have been agreed to, whereas in others, the passage measures have yet to be proposed by ECREM or reviewed by the Service. For these, Appendix A establishes a process timeline to determine the appropriate passage measures.

For all proposed structural fish passage measures, ECREM shall provide the Service with functional design drawings of proposed facilities for its review and approval.

A. Upstream Passage at Mines Falls

ECREM will develop design plans and a construction schedule for the rehabilitation of and improvements to the Mines Falls fish lift system for Service approval and filing with FERC. Appendix A identifies the schedule for submittal of the plans and a proposed construction completion date. The target construction date is April 1, 2015. However, based on the timing of design plan development, time for review and Service approval, and the complexity and extent of necessary construction, that date may need to be adjusted based on mutual agreement between ECREM and the Service.

B. American Eel Silver Eel Passage

In general, the measures to protect adult silver eels during outmigration are either:

- (1) cessation of Project operation from dusk to dawn from August 15 through November 15, annually. Future refinement of the timing and other conditions (such as flow, weather conditions, etc.) that drive the downstream movement may be made by the Service, with concurrence by ECREM, as information on the behavior of migrants at the Projects is obtained. The nightly protocol at some Projects shall include closing or screening the headgates, as agreed upon with ECREM, to prevent eels from becoming trapped in the forebay. A downstream bypass sluice shall be opened to provide a minimum fish bypass flow (needed flows to be determined for each site); or
- (2) operation of a passage and protection system that meets the following criteria:
 - i. a full depth trashrack/screen system with $\frac{3}{4}$ -inch-clear spacing and a desired approach velocity equal to or less than 1.5 feet per

second,¹ in conjunction with a bypass sluice or lower level gate of sufficient size and passing a sufficient flow (to be determined during the designing of the facilities); and

- ii. the downstream passage and protection system shall be designed in consultation with, and require approval by the Service and filed with FERC. The system shall operate annually from August 15 through November 15. Future refinement of the timing and other conditions (such as flow, weather conditions, etc.) that drive the downstream movement may be made by the Service, with concurrence by ECREM, as information on the behavior of migrants at the Projects is obtained.

C. River Herring Downstream Passage

ECREM shall construct, operate and maintain downstream fish bypass passage facilities for adult and juvenile river herring in all years when river herring have been stocked upstream of the Projects. The downstream fish passage measures for downstream river herring passage may be the same as measures implemented for American eels.

The downstream passage facilities shall consist of measures to protect downstream river herring from impingement and/or entrainment, as well as bypass facilities to assist fish in moving safely past the Projects. Final design and construction of the protection system shall occur in consultation with, and require approval by the Service and shall be filed with FERC.

If the downstream bypass facility is deemed ineffective based on evaluations by the Service and ECREM, ECREM shall be required to submit a proposal for amended designs or other measures for approval by the Service within six (6) months of the effectiveness determination.

D. Interim Passage Measures

In the interim periods between execution of the Agreement and the implementation of measures specified in the Agreement and Appendix A, interim passage measures for river herring and American eel will be implemented at the Projects as specified in Appendix A. Interim measures will consist of nighttime shutdowns on the day of and for three consecutive days after a rain event or river flow increase resultant from Lake Management activities by New Hampshire Department of Environmental Services. Initial operational shutdown periods will be from dusk to dawn during the passage season, but the Service and ECREM will cooperatively

¹ Site configuration and Project works of individual Projects may preclude the attainment of this criteria. In that event, the Service will consider a variance to this criteria based on review of the overall Project passage plan.

work together to determine the extent of nighttime shutdowns, taking into account downstream migrant needs and Project operations.

4.4 Fish Passage Facilities Operations and Maintenance Plans

ECREM shall develop and implement a Fish Passage Facilities Operations and Maintenance Plan for each Project with fish passage provisions identified in Appendix A. The plans shall detail how and when the upstream and downstream fishways will be operated and describe routine maintenance activities that will occur both during and outside of the fish passage seasons. The Plan shall be developed in consultation with, and require approval by the Service. The approved Plan shall be in effect prior to the first passage facilities coming on-line, and shall be updated as needed as new passage facilities are placed into service and based on information obtained from operation of the facilities.

4.5 Fish Passage Monitoring and Modifications

ECREM agrees to cooperate with the Service on the evaluation of the effectiveness of the adopted fish passage measures, and agrees to implement reasonable modifications to the passage facilities and their operation in order to provide for safe, timely and effective passage of diadromous fish.

5.0 SUPPORT OF LIHI CERTIFICATION

The Service agrees to support ECREM in its efforts to secure certification from LIHI for the Facilities. In the event that LIHI approval is not achieved for a specific site or sites, ECREM will be relieved of the non-fish passage Agreement obligations as they pertain to the specific site or sites. If ECREM fails to implement the provision of continuous bypass flows and/or fish passage enhancements for a specific site or sites to the satisfaction of the Service, the Service will notify ECREM of such failure, and ECREM will have 60 days to resolve the matter to the satisfaction of the Agencies. If the Service then determines that ECREM has not resolved the matter in question, the Service may terminate this Agreement, upon 10 days' notice to ECREM for the site that has failed to meet the approval of the Agencies. Upon such termination, no Party shall have any further obligation to any other Party with respect to the site in question.

The parties hereby indicate their agreement to the terms above:

Eagle Creek RE Management, LLC

By: [Signature]

Title: SVP Operations

Date: 8-14-14

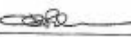

United States Fish and Wildlife Service

By: [Signature]

Title: Assistant Field Supervisor

Date: 8/14/14

Report to the Low Impact Hydropower Institute
Stevens Mill Hydroelectric Project Certification Request

EAGLE CREEK RE, LLC			APPENDIX A	FINAL MOA		USFWS Signature: 	Dated: 8/14/14	ECREM Signature: 	Date: 8/14/14
FACILITY	IMPLEMENT DOWNSTREAM PASSAGE*	IMPLEMENT UPSTREAM PASSAGE	COMPLETE MINIMUM FLOW REVIEW	TARGET SPECIES	PROPOSED ENHANCEMENTS**				
LAKEPORT	2014	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	3/4-inch rack overlays w/ eel collection box & discharge pipe to plunge pool. Consult w/ FWS on permanent racks.				
			Exist	RIVER HERRING	None Needed.				
LOCHMERE	2015	REVIEW IN 2020	2014	AMERICAN EEL	3/4-inch exclusionary trashracks at the canal headworks with open sluice gate at dam and plunge pool.				
				RIVER HERRING	3/4-inch rack and bypass structure for eels. Additional angled floating diversion boom ~ 3 foot skirt.				
				BYPASS FLOWS	Secondary intake trashrack and diversion box and pipe to tailrace. Existing facility to be modified.				
					Perform study of habitat and river needs for bypass reach by December 3, 2014.				
CLEMENT	2015	REVIEW IN 2020	2015	AMERICAN EEL	Exclusionary trashracks at headworks (ECREM will evaluate 3/4-inch rack spacing), bypass sluice and plunge pool.				
				RIVER HERRING	Exclusionary trashracks at dam headworks (ECREM will evaluate 3/4-inch rack spacing), an angled floating				
					diversion boom ~ 3 foot skirt, bypass sluice and plunge pool.				
RIVERBEND	2015	REVIEW IN 2020	2015	AMERICAN EEL	Evaluate required trashrack length for hydro operations. 3/4-inch exclusionary trashrack over days or angled racks.				
					Modify trashgate at dam, set flow requirement and provide plunge pool as needed.				
				RIVER HERRING	3/8-inch exclusionary or angled racks. Modify trashgate at dam & set flow requirement. Plunge Pool as needed.				
STEVENS MILLS	2015	REVIEW IN 2020	2014	AMERICAN EEL	3/4-inch exclusionary trashracks.				
				RIVER HERRING	3/4-inch exclusionary trashracks. Angled surface diversion boom.				
PEMBROKE	See Detail	REVIEW IN 2020	2014	RIVER HERRING	2014 - operate sluice gate at trashracks during outmigration in consult with FWS and NHPGD & review bypass gate, intake velocities & trashracks for permanent passage measure. Modifications to facilities as needed by September 1, 2015.				
				AMERICAN EEL	Eel downstream passage measures within 48 months of notification by NHPGD and/or USFWS.				
				BYPASS FLOWS	Perform study of habitat and river needs for bypass reach by December 3, 2014.				
GREGG'S FALLS	See Detail	REVIEW IN 2020	2014	RIVER HERRING	Discontinue use of salmon smolt downstream fishway.				
				AMERICAN EEL	Eel Downstream Passage measures within 48 months of notification by NHPGD and/or USFWS.				
				BYPASS FLOWS	Continue instantaneous Run of River Operations. Set allowable water level fluctuations.				
					Minimum flows from dam not likely needed. Verify adequacy of flows below dam in 2014.				
MINES FALLS	2015	2015	2014	RIVER HERRING	Provide downstream diversion boom either at the canal headworks or at the intake. Provide a plunge pool for downrunning fish if released out of trash sluice. Move or eliminate downstream pipe.				
					Fish lift drawings to USFWS by 11-1-14. Construction target April 1, 2015, but no later than September 1, 2015.				
	2015			AMERICAN EEL	Downstream eel passage measures will be needed. Review eel downstream passage alternatives with Agencies in 2014.				

* Intake and passage measures for Lakeport, Lochmere, River Bend and Stevens Mills will consist of up to three alternative measures to be chosen for design and construction by the USACE for those measures that are not selected as the preferred alternative. The USACE will select the preferred alternative by November 1, 2014.

** Identified structural passage measures for only one of the two species (American Eel or River Herring) are shown for design and construction by the USACE for those measures that are not selected as the preferred alternative. The USACE will select the preferred alternative by November 1, 2014.

* Identify eel passage measures for Lakeport, Lochmere, River Bend and Stevens Mills will consider all 11 fish subspecies from 2014 as eels for design and construction with the USFWS for these subspecies drive after consultation with NHPGD (downstream flow and migration control groups) by 11/1/14 through November 15, 2014.

** Identified structural passage measures for eels may be replaced by operational shutdowns after analysis of information. All fish passage facilities and other measures to be designed in consultation with and be approved by the USFWS. Operational shutdowns will be evaluated based on the following criteria: Species, Time of Year, Economics, Weather Conditions.



Glenn Normandeau
Executive Director

New Hampshire Fish and Game Department

11 Hazen Drive, Concord, NH 03301-6500
Headquarters: (603) 271-3421
Web site: www.WildNH.com

TDD Access: Relay NH 1-800-735-2964
FAX (603) 271-1438
E-mail: info@wildlife.nh.gov

August 27, 2014

Mr. Stephen Hickey
Essex Power Services, Inc.
Agent for Eagle Creek Renewable Energy
55 Union Street, 4th Floor
Boston, MA 02108

RE: Eagle Creek Renewable Energy Projects – LIHI Certification

Dear Mr. Hickey:

NH Fish and Game concurs with the recommendations and proposed actions, as outlined in the Memorandum of Agreement (MOA) signed by the US Fish and Wildlife Service (USFWS) and Eagle Creek Renewable Management, LLC (ECREM) on August 14th, 2014, regarding several hydroelectric facilities located in New Hampshire. These facilities include Mine Falls (FERC#3442) on the Nashua River, Gregg Falls (FERC# 3180) on the Piscataquog River, Webster-Pembroke (FERC# 3185) on the Suncook River and the Lakeport (FERC#6440), Lochmere (FERC# 3128), Clement (FERC# 2966) and Steven Mills (FERC# 3760) facilities on the Winnepesaukee River.

The Department appreciates the work that has been completed by the USFWS, ECREM and others to reach the actions outlined in the MOA, in order to advance the enhancement and protection of fish and habitat. In addition, the Department agrees that the Low Impact Hydropower Institutes (LIHI) should include a provision acknowledging the applicants concurrence with implementing minimum flows and fish passage measures for herring and/or American eel as prescribed in the MOA, and to undertake such consultations, design development and construction in a timely manner.

If you have any further concerns or questions, please do not hesitate to contact Carol Henderson, Environmental Review Coordinator at carol.b.henderson@wildlife.nh.gov or by phone at 603-271-3511. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Normandeau".

Glenn Normandeau
Executive Director

cc. John Warner, USFWS
Ted Walsh, DES

From: Warner, John [mailto:john_warner@fws.gov]
Sent: Wednesday, April 01, 2015 11:11 AM
To: Bob Gates
Cc: Bryan Sojkowski; Joe McKeon; Dave Robinson (daverobinson111@yahoo.com); Jon Truebe (jtruebe@lakesideengineering.net); Michael Bailey
Subject: Moving Forward on Eagle Creek Fish Passage Projects

Bob - Based on our discussions yesterday regarding fish passage improvements at Eagle Creek's projects, we have agreed to the following:

-- **Mines Falls** -- The proposed designs as depicted in conceptual drawings from Lakeside Engineering, with notes made on the need for a tailwater rating curve, are acceptable. We agree with moving forward to produce construction drawings for the facility and proceeding to construction in 2015.

- **Lochmere** -- The proposed designs of the screening and surface bypass as depicted in the conceptual drawings, with modifications outlined in our January 30, 2015 letter are acceptable. We discussed and agreed to modifications to the eel bypass and trapping facility. Dave Robinson will be preparing revised drawings to depict agreed to changes and circulate those to us for review. We concur with the plan to move to construction drawings and installation in 2015.

- **Clement** - The proposed designs of the screening and surface bypass as depicted in the conceptual drawings, with modifications outlined in our January 30, 2015 letter are acceptable. We discussed and agreed to modifications to the eel bypass discharge pipe and clarification of the plunge pool configuration. Dave Robinson will be preparing revised drawings to depict agreed to changes and circulate those for our review. We concur with the plan to move to construction drawings and installation in 2015.

- **Stevens Mill/Bow Street** - We discussed Eagle Creek's conceptual proposal to address downstream passage at the two project developments. At Bow Street, Eagle Creek proposes installation of narrow-spaced screening to preclude entrainment of eels and herring. At Stevens Mill, the proposal is to: close off the upper trashrack area that is perpendicular to river flow and restore the sluice gate adjacent to the spillway (a bottom opening gate) to use as a surface bypass for eels and herring and to provide some or all of the required minimum bypass flow. The concept is that the orientation of the rack and bypass flow with that gate operating will help to guide fish past the relatively low intake velocity intake and to the bypass. We concurred with the Bow Street proposal and agree with the concept of the Stevens Mill proposal. Dave Robinson will be developing design drawings of these facilities for our review and comment. We concur with the plan to move to construction drawings and installation in 2015.

For all projects, we request that conceptual design drawings be provided to me and Bryan Sojkowski, and that Bryan also receive proposed construction drawings.

Let us know if there is anything else you need in order to proceed with these projects.

-- JW

John P. Warner
Assistant Supervisor, Conservation Planning Assistance and Endangered Species
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 0330-5087
phone: 603-223-2541, Ext 15
fax: 603-223-0104

From: Warner, John [mailto:john_warner@fws.gov]
Sent: Tuesday, June 09, 2015 3:15 PM
To: Jeffrey Cueto
Subject: Re: LIHI: Stevens Mill Hydroelectric Project

Hey Jeff -- Sorry -- Lost that one somewhere...

#1 - Letter to LIHI did not happen but we are supportive - they are developing final plans and installation of new facilities there this year.

#2 - Bypass flow demos got delayed mostly by our lack of time/availability. Hope to do this and 2 others this summer. I have to check notes to see if its me or them that are to set up a date

#3 - Did not see that I don't recall

#4 - We agreed on conceptals and Final design plans are begin developed - we are in agreement and they are planning on installing this year - we are good on this one

hope that helps.. starts anyway

-- jw

On Tue, Jun 9, 2015 at 3:06 PM, Jeffrey Cueto <ompompanoo@aol.com> wrote:

John – If I could hear back, I would appreciate it. If you want me to call instead, let me know.

Thanks.

Jeff

From: Jeffrey Cueto [<mailto:ompompanoo@aol.com>]
Sent: Thursday, May 28, 2015 2:46 PM
To: 'Warner, John'
Cc: 'Walsh, Ted'; 'Steve Hickey'
Subject: LIHI: Stevens Mill Hydroelectric Project

John – I am completing my final review of the Stevens Mill Project for LIHI and have some questions for you regarding the application and the August 2014 MOA.

1. Section 1.2 of the MOA indicates that the FWS will send LIHI a letter of support within 3 weeks of the MOA being finalized. Did that happen?
2. With respect to bypass flows, the MOA schedule in Appendix A indicates that the review would be completed in 2014 and that the bypass conservation flow would be subject to FWS approval (and initiated upon LIHI certification). If there is an approved conservation flow, please confirm that the flow is “appropriately protective of fish, wildlife, and water quality.” Please also clarify whether flows are necessary in the short reach between the dam and the Bow Street powerhouse tailrace.
3. Under the MOA, ECREM was to file a flow monitoring plan with the FWS within 6 months for its review and approval. Could you let me know what the status of that filing is?
4. With regard to downstream fish passage, my understanding is that interim passage is currently in effect and that a surface boom, exclusionary racks and a fish sluice are to be installed this year as a permanent measure. Functional design drawings are to be developed in consultation with the FWS and are subject to FWS approval. Could you let me know the current status?

Thanks for your help, John.

Jeff

From: Walsh, Ted [<mailto:Ted.Walsh@des.nh.gov>]
Sent: Friday, June 05, 2015 10:27 AM
To: 'ompompanoo@aol.com'
Subject: RE: LIHI: Stevens Mill Project

Jeff,

The data submitted so far indicates that the upstream and downstream segments are meeting the water quality standard for chlorophyll-a. The total phosphorous results do not indicate that there are problematic levels of that parameter. We do not have any of the other data so I cannot speculate as to whether the river is meeting the water quality standard for dissolved oxygen or whether there are problems with water temperature.

Feel free to call if you need further information.

Ted
603-271-2083

From: ompompanoo@aol.com [<mailto:ompompanoo@aol.com>]
Sent: Monday, June 01, 2015 4:43 PM
To: Walsh, Ted
Subject: Re: LIHI: Stevens Mill Project

Ted - If, based on whatever information you have on the river, such as wastewater loading, hydro operations, and the previously collected Franklin Falls data, you can state that there is reasonable assurance that the quantitative standards are being met, then I can recommend certification conditional upon them completing the study this summer and your being able to review the study data and confirm compliance. I can give you a call if this isn't clear.

Thanks!
Jeff

Sent from my iPhone

On Jun 1, 2015, at 3:33 PM, Walsh, Ted <Ted.Walsh@des.nh.gov> wrote:

Jeff,

We have the total phosphorous and chlorophyll-a data but the datalogger data was not reliable enough and it was agreed it would be redone. Which data are you looking for me to comment on?

Ted

From: Jeffrey Cueto [<mailto:ompompanoo@aol.com>]
Sent: Thursday, May 28, 2015 4:25 PM
To: Walsh, Ted
Cc: 'Steve Hickey'
Subject: LIHI: Stevens Mill Project

Hi, Ted. I understand that the data from 2013 was faulty and that the owner intends to collect data this summer to demonstrate compliance with N.H. water quality standards. Since the owner is seeking LIHI certification ahead of the completion of the sampling, can you provide an opinion that “there is reasonable assurance that the waters in the Facility area and in the downstream reach are in compliance with the state’s quantitative water quality standards based on available data, river characteristics, permitted wasteloads, project operating constraints (e.g., spillage, hydraulic operating range) and other relevant data”? As you likely recall, projects can be certified as long as state water quality officials provide a “reasonable assurance” statement. Then the sampling can be completed to verify compliance.

As I recall, we had recently certified the Franklin Falls project immediately downstream, and no water quality conflicts were identified at that time.

Thanks.
Jeff

><{{{~}}> **Jeffrey R. Cueto, P.E.**
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